

Student's Support Material

Criterion A: Inquiring and analyzing

Maximum: 8

- i. Explain and justify the need for a solution to a problem for a specified client/target audience
- ii. Construct a research plan, which states and prioritizes the primary and secondary research needed to develop a solution to the problem
- iii. Analyse a group of similar products that inspire a solution to the problem
- iv. Develop a detailed design brief, which summarizes the analysis of relevant research

What do you need to do?

1. Explain and justify the need for a solution to a problem for a specified client/target audience

Once students have been presented with the situation, they will need to identify a problem to solve, explain it and justify the need to solve it.

Students may ask the following questions to identify a problem from the situation.

- What is the nature of the problem?
- Who is it a problem for?
- Where is the problem occurring?
- What is the cause of the problem?
- What effect is the problem having?

Strategies to answer the above questions may include:

- ✓ identifying a target user by applying brainstorming or mind-mapping techniques
- ✓ interviewing, surveying and/or polling potential clients
- ✓ observing, filming and/or photographing users interacting with a product
- ✓ collecting data from experts to confirm there is a real need for a solution to the problem
- ✓ seeing the situation from the user's/client's point of view (as an example, refer to "Paul Bennett finds design in the detail" at www.ted.com).

2. Construct a research plan, which states and prioritizes the primary and secondary research needed to develop a solution to the problem

Students are encouraged to formulate a list of questions in order of importance that will help prioritize and guide their research. Students will need to identify:

- the questions that need to be answered to solve the problem
- the relevant data that needs to be collected
- where the data will be sourced from
- whether sources are primary or secondary
- which sources are essential and which are desirable.

The nature of and amount of research required will vary depending on the level and the nature of the design problem/challenge. By the end of the course, students should be able to conduct primary, secondary, qualitative and quantitative research.

Table 1 outlines primary and secondary research tasks that students could carry out to gather the answers to their research questions.

<div>Secondary research</div> <div>(Indirect: Desk research)</div>	<div>Primary research</div> <div>(Direct: First-hand research)</div>
<div>Secondary research involves using data collected by other people.</div> <div>Examples include:</div> <ul style="list-style-type: none">• analysing data from a website or book• reading accounts of a problem written by another person• analysing articles in magazines, journals and newspapers• downloading data from a marketing website• viewing videos about how to use materials, tools and processes.	<div>All primary research is carried out by the student, who collects his or her own data.</div> <div>Examples include:</div> <ul style="list-style-type: none">• conducting interviews, surveys and polls with a target audience and/or client• interviewing experts over the telephone• writing letters or emails asking for specific information about a product from a client• observing users interacting within the situation and making notes• analysing products that have things in common with the problem• investigating the work of other designers of existing products• conducting market research such as surveys, questionnaires and interviews through focus groups• experimenting with materials, tools and processes.

Table 1
Primary and secondary research tasks

When will I do this?	Why will I research this information?	How will I gather the information? SECONDARY SOURCE	How will I gather the information? PRIMARY SOURCE	What will I research?
Sept 22 nd	I want to find out what items are to be stored in the jewellery box, how many of each items does she want and drawers, hanging space, mirrors etc. I also want to find out her preferred design ideas and colours so I know how to make it for her.		INTERVIEW I will interview my cousin to find out what colours she likes and what kind of drawings or graphics she wants on the jewellery box. What shapes does she want it to be and what features or any other extra things does she want on there.	End user (My Cousin)
Sept 22 nd	This will help me to get better ideas of the designs on the market. I can compare designs, colours, finishes, materials etc. I will also look at the sizes and interior of the box to see what is inside, and how they function – doors opening, drawers etc.		PHOTOS I will go to the shopping malls to take photos of existing jewellery boxes. This will help me by seeing different designs to help me with some ideas for my own design.	Existing designs (field research)

Sept 28 th	<p>I need to find suitable joints which are practical, easy to create, functional, serves its purpose, and look good. The joints are important as it will hold my box together. It will need to have special joints to make the drawers work, shelves fit, etc.</p>	<p>INTERNET</p> <p>After researching the types of jewellery boxes and the materials that were used for making it. I will look on the internet to research what kind of joints are best to use for making my own jewellery box and make sure that it is strong enough to hold all the pieces together.</p>		Wood joints
Sept 28 th	<p>I will measure the jewellery to be able to work out the size I need it to be. If I measure the biggest items then this will allow all sized items to fit into the box.</p> <p>I also need to find out the average size of a 13 yr old girls hands and fingers to allow me to design the compartments and</p>	<p>ANTHROPO METRICS – internet</p> <p>I am also going to find some anthropometric data from the Internet. I will focus on the size of a 13 year old girl's hands</p>	<p>MEASURING</p> <p>I will measure my cousin's items of jewellery she wants to put into the jewellery box so I can be sure that the final design fits into the required space.</p>	Measuring

	<p>drawers which she will be placing her jewellery into. This will help her to remove and place the jewellery easily.</p>	<p>and fingers.</p>		
<p>Oct 1st</p>	<p>I need to find the appropriate materials. They need to be the right size and look good. I need to choose suitable material which I know my cousin likes, but I am also able to make the correct joints from. This is important as I want it to be fully functional, but also look great.</p>		<p>PHOTOS</p> <p>I will have to research and find out what material I will use to make this project. I will check the workshop if those materials are available there or not, otherwise, I will have to go to stores like IKEA or other hardware stores to get the materials ready.</p>	<p>Materials (Field research)</p>
<p>Oct 6th</p>	<p>This is so I can compare designs of the handles to see which will look best on my box design.</p> <p>It is also to find out which will have the most suitable style of locks so it can lock as she wants it to.</p>	<p>MAGAZINES</p> <p>I am going to buy a range of magazines to find pictures of handles and locks I can use for my design. I will also collect free magazines from furniture shops to see a variety of pictures.</p>		<p>Finishes (Handles, hinges & locks)</p>
<p>Oct 8th</p>	<p>This will allow me to get good feedback on</p>		<p>QUESTIONNAIRE</p>	<p>Target</p>

	<p>what the majority of people think is the best size, colour, design etc. for my design. It may even give me good ideas I had not thought of. I will summarise this data to find definite results to my research.</p>		<p>I will hand out a questionnaire to a suitable range of people similar to who I am making it for. I am going to make this for my cousin who is 13, so I am going to hand out my questionnaire to 20 female students at school between the ages of 12-14.</p>	<p>market</p>
<p>Oct 10th</p>	<p>I will disassemble to be able to clearly see all of the parts to the jewellery box. I want to see how the drawers are joined together, how the handles are attached, how the hinge works, what joints have been used to construct all of the different parts.</p> <p>By disassembling the garden chair, I will see how I can design the collapsible shelves in my design.</p>		<p>EXISTING DESIGNS AND/OR SIMILAR PRODUCTS</p> <p>I am going to disassemble existing jewellery boxes. My little sister has one, so I will use this. I also have an old one which I do not use anymore, so will take it apart to observe and analyse.</p> <p>I am also going to disassemble a garden chair to research the collapsible mechanisms used.</p>	<p>Disassembly</p>

Figure 1
Research plan example: Jewellery box

3. Analyse a group of similar products that inspire a solution to the problem

There may be a wide range of products that solve similar problems to the one assigned to students. Before beginning to develop a specification and designs, students need to identify existing products that solve a similar problem, could partially solve their problem or could give them ideas on how to solve their problem. Students will need to employ a range of strategies to analyse these products, such as:

- identification of and interaction with similar products when out shopping
- attribute listing of existing products
- SWOT analysis (strengths, weaknesses, opportunities and threats)
- functional analysis
- aesthetic analysis
- graphical disassembly analysis
- performance testing of products
- evaluation of past student projects
- secondary research through product reviews on consumer websites, buying guides or magazines
- summary of customer reviews on commercial websites.

Note: Methods could include analysis of a graphic or analysis through sketching of parts.

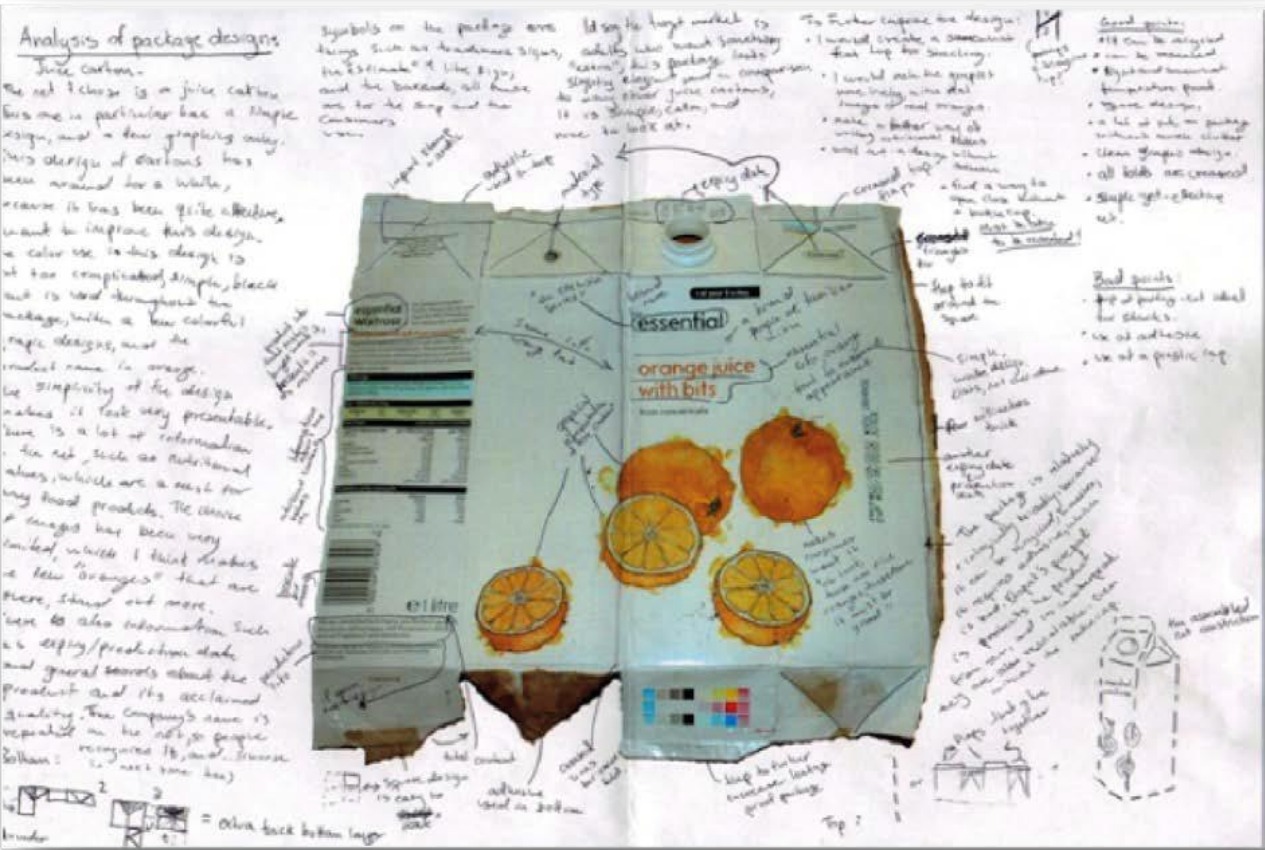


Figure 2
Analysis example: Fruit juice packaging

Logo analysis

Use a series of guiding questions to complete aesthetic and functional analysis of the work done by a peer

1. Type of logo:
 - illustrative logo (clearly illustrates what a company/person does, likes or dislikes)
 - graphic logo (includes a graphic, often an abstraction, of a company/person does)
 - font-based logo (a text treatment which represents a company/person)
2. Shape:
 - Does it have a recognizable shape?
 - Is the outline simple?
 - Is it simple abstract, can be discernible in small sizes?
3. Type of logo:
 - illustrative logo (clearly illustrates what a company/person does, likes or dislikes)
 - graphic logo (includes a graphic, often an abstraction, of a company/person does)
 - font-based logo (a text treatment which represents a company/person)
4. Shape:
 - Does it have a recognizable shape?
 - Is the outline simple?
 - Is it simple abstract, can be discernible in small sizes?
5. Contrast:
 - Does contrast aid shape-recognition by making the edges between elements clearer?
 - Does contrast create dynamism?
 - Compare the brilliance/luminosity of the foreground and the background. The greater the difference, the greater the contrast
6. Effort:
 - Does the logo evidence the use of techniques learnt in class? (use of layers, transparency, gradients, effects or filters, fancy typography, tracing complicated shapes, transforming, graphic styles)

Source: Logo Design for Websites <http://www.webdesignfromscratch.com/web-design/logos/>

This is a graphic logo because we can see a graphic, most probably representing something he is proud about and likes. The tango is representative of Argentina because it's a dance invented in this country, and this student is very proud about his country. We can recognize a shape of two people dancing tango, it represents pride, the colors and the shape are well used to give an impression of elegance. Here it shows the good use of vector drawing technique, so we can say he had applied the techniques learnt in class.



Figure 3
Logo analysis example

4. Develop a detailed design brief, which summarizes the analysis of relevant research

At this point, students have collected a great deal of data that requires analysis and summary to inform the design of the solution and be useful. The analysis and summary must be presented in a *design brief*, a series of detailed paragraphs that present only the useful information.

The brief shouldn’t solve the problem at this stage, but instead outline what the student intends to design to solve the problem, provide answers to each of the research questions, and clarify the essential and desirable features of a solution. It should also state any determined values that the design must meet, such as the following.

- When designing a bird house, the student may have researched the size of desired birds and therefore determined the size of the entry hole to the bird house.
- When designing a new noodle product, the student may have determined the “base” recipe for making the noodles as part of his or her research.
- When designing a web page, the student may have identified certain fonts or images that need to be included.
- When designing a video game, the student may have identified particular sprites that he or she will use to represent the main characters in the game.

When writing a design brief	
Students should NOT:	Students should:
<ul style="list-style-type: none">• write large paragraphs of text• include statements that do not relate to solving the problem• make statements without evidence from expert opinion or data• include all of their research within the body of the project.	<ul style="list-style-type: none">• present information concisely• explain how and why the information is relevant to solving the problem• evaluate the validity of the data• present their research in an appendix• cite all sources of information using appropriate conventions.

Table 2
Guidelines for design brief writing

Consider the following:

- how to write a complete bibliography (or how to use an online citation tool)
- working with the school librarian to check the accuracy of bibliographic referencing

After researching the problems my parents have with their bedroom and bathroom, I have decided to design a dressing table for my mom which for her bedroom.

This dressing table will:

- Include a mirror large enough for my mom to use when preparing in the morning.
- Include special designed accessory holders for the variety of jewellery and accessories my mom has so that they will all be neat, presentable and easy to take off and put on.
- Include a place/tray for all the perfume to be able to stand on, which will make it easy for my mom to choose her perfume each day.
- Include a few little storage boxes which my mom can place her hair clips in, her hair ties in, and other accessories or products that cannot get tangled up with each other.
- Be decorative, so that it really fits in with bedroom and will add to the bedroom being a cosy and warm room.
- Have a place for candles where they are safe (from falling and safe to light up) and will add to the look and feel of the room.
- be made so that it is very stable, this will be done through constructing the table using the series of joints that I have identified in the research.
- include at least one of the colours of the bedroom so that it fits with the bedroom.
- be according to the measurements of my mom, so that she will be able to sit down easily and so that her legs are not against the bottom of the table as well as placing everything well so that my mom can easily reach everything and place everything when she used something.
- be environmentally friendly because it will be recyclable and so if my parents decide to throw it away after a few years of use, the materials can be used for other projects or making other objects.
- be user-friendly.

This project will help my mom save time as well as storage space as well as finishing the design of her bedroom which she wanted to make more cosy and presentable and neat.

Figure 4

Average quality design brief example

Source:

https://ibpublishing.ibo.org/server2/rest/app/tsm.xql?doc=m_8_techn_tsm_1406_1_e&part=3&chapter=4